
Puget Sound
Shoreline Stewardship
Guidebook
King County Edition
Developed by Puget Sound Water Quality Action Team
Revised and reprinted by the King County
Department of Natural Resources and Parks
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King County
Department of
Natural Resources and Parks

Puget Sound Shoreline Stewardship Guidebook

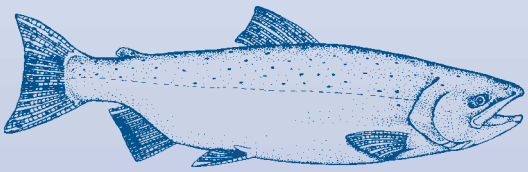
A sample of the plants and wildlife that rely on King County shorelines for survival.

Bald eagles *nest in large trees at the shore's edge where they also perch to look for prey.*

Great blue herons *wade and hunt in shallow shoreline waters and nest in trees above the beach. Shoreline development can destroy these habitats and displace these shy birds.*

Surf smelt *are small fish that are an important food source for many species of birds and larger fish. Surf smelt lay eggs high on the beach, an area easily affected by construction activities.*

River otters *have the best of both worlds, using riverbanks and marine shorelines for shelter and food. They may leave pups onshore while hunting for food.*

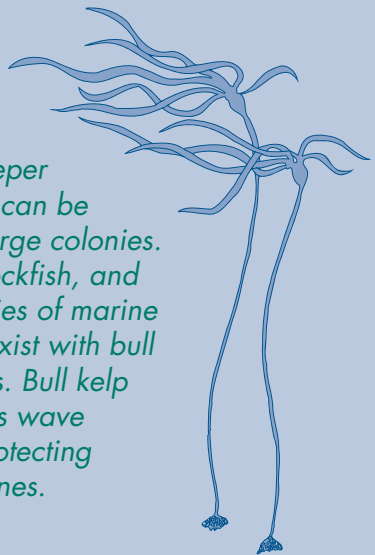


Young chinook salmon *spend up to a year in shoreline habitats such as eelgrass beds, feeding on small baitfish before migrating out to sea. Resident blackmouth chinook depend on the Puget Sound and its shorelines their whole lives.*

These plants and wildlife, along with thousands of other species, are intricately connected and help make Puget Sound rich in life. Their survival depends, in part, on our stewardship of their habitat.

Eelgrass beds *occur in calm, shallow water and provide habitat for many marine animals including surf smelt, herring, young salmon, and herons. Eelgrass is sensitive to trampling, propeller damage, and shading from docks and other structures.*

Bull kelp *grows in slightly deeper water and can be found in large colonies. Salmon, rockfish, and other species of marine plants co-exist with bull kelp forests. Bull kelp also buffers wave energy, protecting our shorelines.*



Dune grass *grows in the backshore and shoreline wetlands with rare salt-tolerant plants such as searocket, beach pea, and gumweed. Backshore meadows are an important — and increasingly rare — habitat for many birds and animals.*

King County
Department of Natural Resources and Parks
Water and Land Resources Division

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A Regional Treasure in Your Care

Puget Sound is a cultural, aesthetic, economic and ecological treasure that binds together millions of people and thousands of species in the Pacific Northwest.

As a shoreline resident, there are a few important things for you to understand: erosion, drainage and vegetation.

Whether you are doing your own development or you have inherited someone else's choices with your property, once you understand erosion, drainage, and vegetation, there is plenty you can do to protect your property and be a good steward of Puget Sound's shorelines.

A Plan for the Land

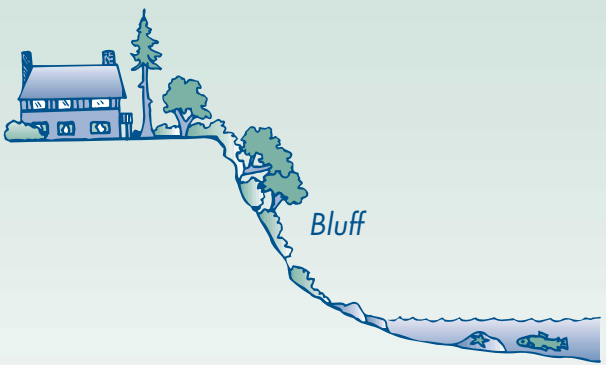
Whether you are doing your own development or you have inherited someone else's choices with your property, there is plenty you can do to improve the aesthetic and ecological value of your shoreline!

Life on the Edge

Your long-term plan must take into account the specific nature of your property. Bluff and beach shorelines function differently and should be approached differently.

Low banks include the gravel, sand, and muddy beaches along the Sound. Property on low banks may be subject to wind and water damage, extreme tides, and landslides from above. Mud beaches usually indicate a more sheltered area where wind and waves are not a problem, but flooding may still occur.

Bluffs are products of millions of years of glaciation and thousands of years of erosion. Most King County bluffs are composed of many layers of glacial sediment (sand, gravel, and clay). Most bluffs periodically experience landslides; this is nature's way of replenishing the beach with essential sand and gravel.



Understanding Erosion

Puget Sound beaches are dynamic. Storms erode bluffs and currents redistribute sand, gravel, and driftwood along the shoreline. This cycle keeps beaches supplied with sediment so they don't wash away. It also provides essential substrate for animals and plants.

Steep slopes are naturally unstable. When water builds up in the soil faster than it can drain, slope instability increases. **In fact, most shoreline landslides are caused by excess runoff and poor drainage, rather than wave action.** Even so, long-term erosion rates average only 4 inches per year in central Puget Sound.

Undeveloped land with trees and other vegetation readily absorbs rainfall. When we remove vegetation, build houses, and pave driveways, we reduce the ability of the land to absorb water and increase runoff.

Explore Your Options!

Knowing how and why erosion happens helps us understand beneficial choices we can make to reach a sustainable long-term site plan. As you explore your alternatives, talk to lots of people and ask questions!

Ask a geologist or habitat biologist:

- What kind of landform is this? (Bluff or beach? Bedrock or glacial till?)
- What is the potential for flooding or landslides?
- Are there any drainage problems that need to be addressed?
- Are existing structures addressing or creating problems?
- How could we restore or enhance natural sediment processes?

Ask a habitat biologist or landscape architect:

- How could landscaping help to reduce water runoff?
- What trees would grow well and help to stabilize the shoreline?
- What plants are best for shade, cover, and habitat?
- What plants require little or no watering and chemical application?
- How could we improve or restore habitat?

Ask your local planning department:

- Is this property classified as a Sensitive Area or Environmentally Critical Area?
- Which activities in my site plan require permitting and review?
- How much lead time do I need to allow for permit review?
- Are there options that would not require a permit?

Always ask:

- What range of options do I have?
- What are the long-term maintenance costs of each option?

A word of caution: contractors are not scientists. They are in the business of building things. A contractor is a great choice to *implement* your site plan, but you should consult others to *develop* your site plan.

Reducing Runoff

Shoreline development can aggravate erosion. Therefore, managing excess runoff and preventing water from accumulating in the soil are critical to protect your property from excessive erosion.

- If you live on a bluff, manage drainage carefully to avoid large quantities of water from saturating the soil and destabilizing the slope.
- Direct drainage from downspouts beyond the base of the bank.
- Use porous surfaces (bricks, flagstones, or gravel) rather than pavement.
- Inspect and maintain your drainage and septic system annually.
- Protect vegetation. During construction, minimize clearing and revegetate slopes as soon as possible.
- Don't overwater your lawn. Most lawns need only 1.5 inches per week *total*, including rain.
- Landscape with plants that require little watering once established. Natives are best.

A word of caution: thick piles of lawn clippings can stifle the vegetation that stabilizes slopes and banks. Clippings can also clog streams and stifle aquatic plants and animals. Use a composter rather than dumping your clipping into sensitive areas.

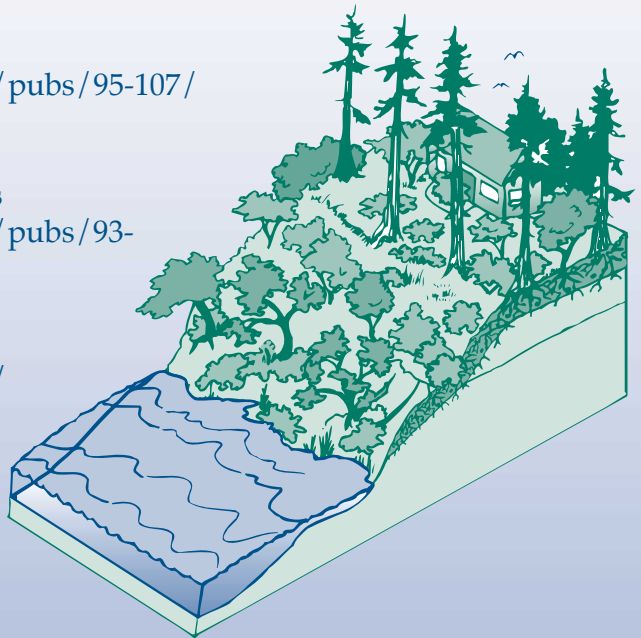
Runoff References

These valuable references are available through the Washington Department of Ecology. Get them online or call 360.407.7472.

Managing Drainage on Coastal Bluffs
http://www.ecy.wa.gov/programs/sea/pubs/95-107/intro.html

Managing Vegetation on Coastal Slopes
http://www.ecy.wa.gov/programs/sea/pubs/93-31/intro.html

Controlling Erosion Using Vegetation
http://www.ecy.wa.gov/programs/sea/pubs/93-30/intro.html



Go Wild!

Plants are valuable assets on waterfront property. Their roots stabilize slopes, their canopy offers habitat, and they help keep soils from becoming oversaturated with water.

Consider letting some of your land grow wild and using native plants in your landscaping

- You'll have less to mow.
- Thickets make great habitat for songbirds and other wildlife.
- Once established, many native plants need little watering.
- Native plants rarely require chemical applications.

Pacific madrone

Best Erosion Control Plants

Native shrubs

Oceanspray
Snowberry
Salal
Serviceberry
Evergreen huckleberry
Red-osier dogwood
Sword fern

Native trees

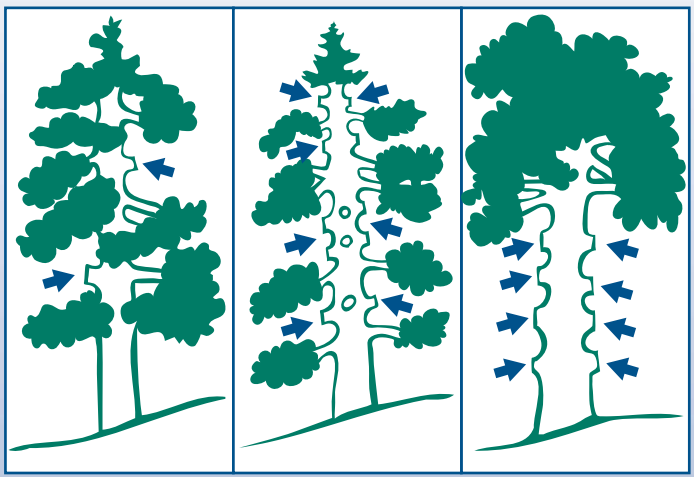
Pacific madrone
Shore pine
Douglas fir
Western red cedar
Sitka spruce
Vine maple
Willow (Pacific, Scouler's, or Sitka)

Douglas fir

Prudent Pruning

Trees are invaluable long-term investments for protecting waterfront property from erosion and landslides. Once a tree is removed, its functions can never be replaced. What if a tree is blocking your view? Before reaching for the chain saw:

- Consider limbing or pruning, as shown to the right — but NOT topping! Topping makes trees vulnerable to disease.
- Instead of removing an entire stand of trees, remove one or two and infill with native shrubs.
- If a tree must come down, leave its roots in place for bank structure, and leave some trunk for wildlife habitat.
- Plant shrubs or young trees around the base of a cut tree.



Alien Invaders!

Some plants and animals don't really belong on our shores but have managed to sneak in and make themselves at home, crowding out useful native species. Exotic plants should be reported and removed, and the area should be replanted with native vegetation.

Spartina is an invasive cordgrass that is taking over tideflats in Puget Sound and coastal Washington, altering natural fish and shellfish habitats and excluding native vegetation. If you see circular clumps of grass growing in a mudflat, it may be Spartina. Contact the State Spartina Program at 360.902.1923.

Himalayan blackberry, Scot's broom, English ivy, and Japanese knotweed will aggressively out compete most other vegetation. Giant hogweed grows in moist areas and can cause severe lesions on unprotected skin.

For assistance identifying and combatting exotic and invasive plants, contact
King County Noxious Weed Program at 206.296.0290
http://dnr.metrokc.gov/wlr/lands/weeds/index.htm

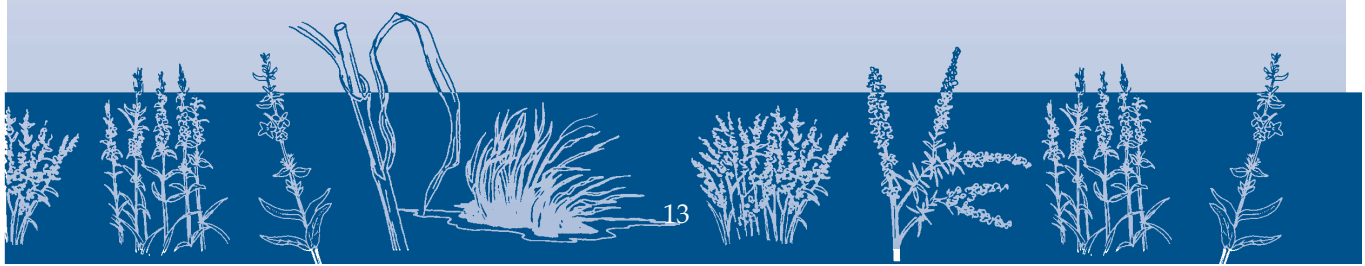
Washington State Noxious Weed Control Board. 206.872.2972
http://www.wa.gov/agr/weedboard/index.html

Before You Clear....

Shorelines are frequently classified as **sensitive areas**, because they are susceptible to landslides, water quality problems, and habitat damage. Therefore, permits and revegetation plans may be required. Before you clear, call!

See **PAGES 20 and 21** for information about the permitting process and for a list of contacts.

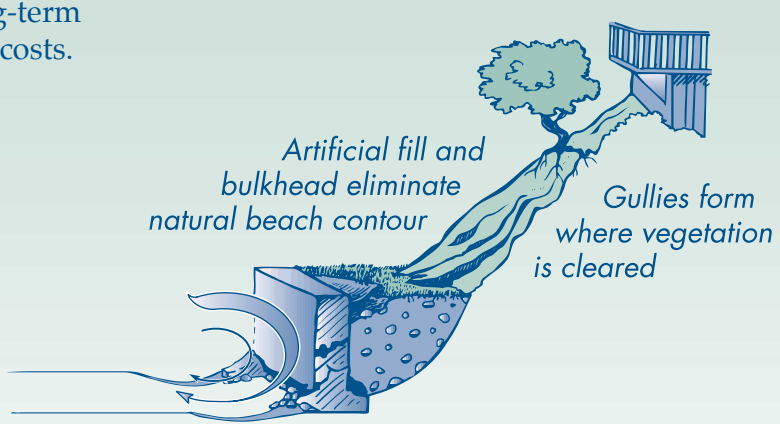
To help identify nuisance plants and guide you through the clearing process, the Washington Department of Fish and Wildlife (WDFW) has developed a useful booklet, *Aquatic Plants and Fish*. 360.902.2534
http://www.wa.gov/wdfw/hab/aquaplnt/aquaplnt.pdf



Debunking Bulkheads

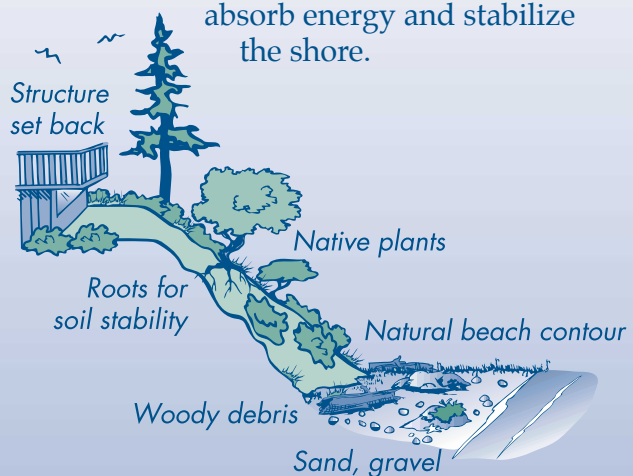
Since most erosion results from upland drainage problems rather than wave action, bulkheads and rock seawalls may not be appropriate solutions. In fact, many traditional armoring projects are doomed from the beginning and may actually endanger your property, incurring long-term financial and environmental costs.

To see some bulkhead removal projects, request **Alternative Bank Protection Methods for Puget Sound Shorelines.** Washington Department of Ecology publication # 00-06-012. Call 360.407.7472 for more information.



Making Peace with Gravity

Our improved understanding of shoreline has revealed more effective long-term approaches for stabilizing the shore. Natural beaches are a great model; look for ways to enhance nature's ability to absorb energy and stabilize the shore.



For technical assistance on maintaining or restoring your natural shoreline:

King County Department of Natural Resources and Parks

Jim Brennan, Nearshore Ecologist
206.296.8341 jim.brennan@metrokc.gov

Katy Vanderpool,
Vashon-Maury Island Basin Steward
206.296.8362
katy.vanderpool@ metrokc.gov

Washington Department of Fish and Wildlife.

Pam Erstad, Regional Habitat Biologist
425.379.2306
erstapke@dfw.wa.gov

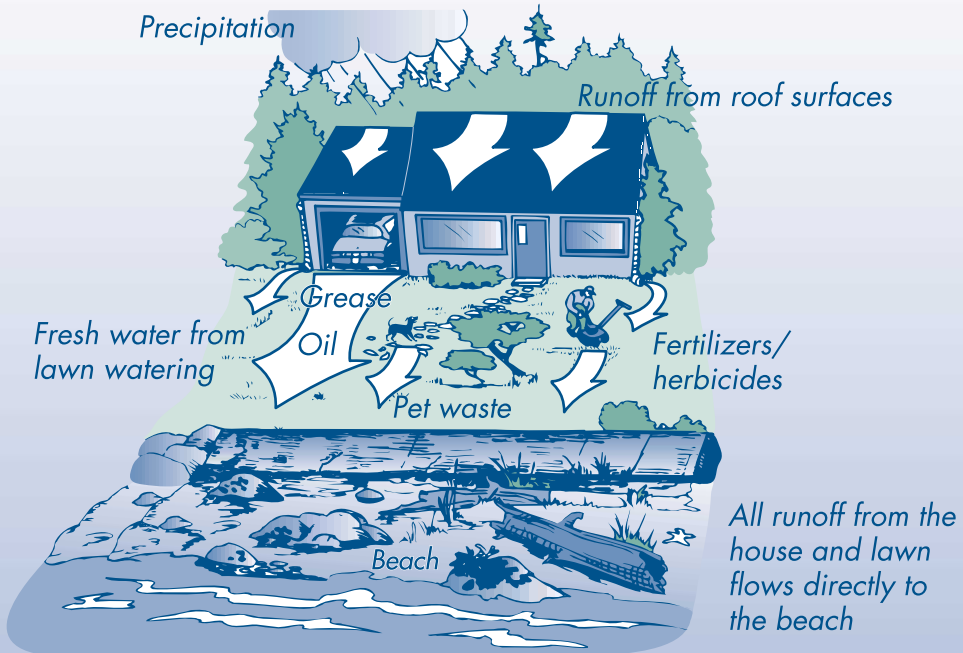
Water Quality

As it flows across the land, rainwater can pick up oil or grease from roads and driveways, chemicals from gardens and lawns, and pet waste. These pollutants are carried to the Sound where they can harm marine plants and animals, make waters unsafe for swimming and make shellfish unsafe to eat.

To protect water resources:

- Keep your car tuned. Regular tune-ups help prevent leaks.
- Dispose of pet waste in your trash.
- Visit a professional car wash, where soapy water is recycled. OR wash your car or boat on the lawn (not on pavement) using a mild, phosphate-free soap.
- Maintain a healthy buffer strip of native woody plants along the shoreline.
- Do not use toxic household or lawn chemicals.

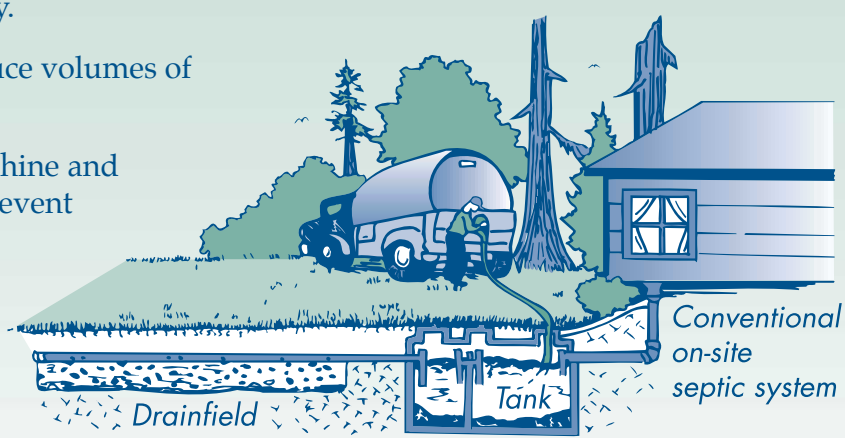
What do YOU Add to Puget Sound?



Understanding On-Site Septic Systems

If your home has a drainfield, slope drainage and water conservation are critical. Septic systems require routine maintenance, inspection, and pumping to operate properly. Inspect your system at least every three years and have the tank pumped as needed by a certified professional.

- Put only waste and toilet paper into the system.
- Don't use septic tank additives. They can kill the "good bugs" that make your septic system work effectively.
- Conserve water to reduce volumes of sewage.
- Sequence washing machine and dishwasher loads to prevent surges of water.



Septic Savvy

Runoff from failing septic systems can contaminate wells and beaches, make shellfish inedible, and pollute swimming waters. Here are some signs of underground problems:

- Water pooling in your yard or elsewhere
- Foul odors
- Dark gray or black stains in soil near the drainfield
- Poorly flushing or backed up toilets
- Excessive algae growth on drainage pipe outlets or as visible seeps on the beach.

If you notice any of these signs, call your local health department or a septic professional for advice.

Water conservation makes good economic sense: low flow toilets and water-saving washers reduce water use and usually pay for themselves in less than a year!

Playing by the Rules

To protect your property, your safety and our region's natural resources, federal, state and local guidelines establish rules for work performed in or near the Sound. These rules may apply to clearing vegetation, grading land, drainage and construction projects, and the use of some chemicals.

To determine if your project requires special permits, call your city government; they will advise you of local, state, and federal guidelines. For residents of Vashon Island and other unincorporated areas of King County, contact the King County Department of Development and Environmental Services.

- When you call, have on hand the address, parcel number and/or legal description of the land.
- Give yourself plenty of lead time! Some *minimum* timelines range from **45 to 120** days.







Permitting Information

City of Des Moines	206.870.7576
City of Normandy Park	206.248.7603
City of Shoreline	206.546.1811
City of Burien	206.248.5520
http://www.ci.burien.wa.us/commdvlpmnt/app_formpg.htm	
City of Seattle	206.684.8850
Department of Construction and Land Use Services	
http://www.ci.seattle.wa.us/dclu/default.asp	
King County	206.296.6600
Department of Development and Environmental Services	
http://www.metrokc.gov/ddes/perminfo/index.htm	
Department of Ecology	360.407.7037
Permit Assistance Center	
http://www.ecy.wa.gov/programs/sea/pac/index.html	
Washington Department of Fish and Wildlife	425.775.1311
http://www.wa.gov/wdfw/hab/hpapage.htm	
US Army Corps of Engineers	206.764.3495
http://www.nws.usace.army.mil	

Explore the Shore!

You share the shore with thousands of species of plants and animals, most of which are very sensitive to human impacts. To explore the shore gently:

- Leave all rocks, shells, driftwood, and other natural materials where they are. They provide shelter for many beach creatures!
- If you pick up a rock, carefully put it back the way you found it so creatures living underneath aren't exposed to the sun and air.
- Fill in any holes you dig. This protects shellfish and people!
- Keep dogs leashed to prevent them from scaring wildlife, OR leave them at home.
- Clean up pet waste to protect water quality.
- Most beaches in King County are not safe for shellfish harvest. Check on conditions and be sure to get a permit!

Explore Online!

To learn more about Puget Sound Shorelines, check out these great online resources:

Shellfish Biotoxin Hotline. 1.800.562.5632
http://www.doh.wa.gov/ehp/sf/biotoxin.htm

Shellfish regulations and permits. 1.866.246.9453
http://www.wa.gov/wdfw/fish/regs/fishregs.htm

Puget Sound Shorelines Homepage. Beautiful and informative webpage developed by the state Department of Ecology and Puget Sound Water Quality Action Team.
http://www.ecy.wa.gov/programs/sea/pugetsound/index.html

King County Nearshore Homepage. Even more resources to help you learn about, live with, and protect our shorelines.
http://dnr.metrokc.gov/wlr/watersheds/puget/nearshore/index.htm

Seattle Aquarium. A webpage rich in images and information!
http://www.seattleaquarium.org/

Shoreline Stewardship

If you want to help preserve and restore Puget Sound and its shorelines, several resources are available:

King Conservation District (KCD). Provides free information on water and soil protection and wildlife enhancement.
206.764.3420
http://www.kingcd.org/index.htm

King County Programs. Funding sources and volunteer opportunities in King County. 206.296.1968
http://dnr.metrokc.gov/wlr/resource.htm

State Funding Sources. A comprehensive list of funding sources for protection and enhancement through state, local, public, and private organizations.
http://www.wa.gov/puget_sound/Programs/Funding.htm

Vashon-Maury Island Steward. Responds to citizen inquiries, facilitates restoration and monitoring programs, and provides public education to Vashon and Maury residents.
206.296.8362
http://dnr.metrokc.gov/wlr/BASINS/Bsprgm.htm

Protect and Preserve

Preservation may entitle property owners to significant tax breaks! Several options exist for preserving your land, based on your goals and the conservation value of your property. These include temporary or permanent protection; donating, selling, or retaining your land; going through public agencies or private land organizations. To explore your options, contact:

Private Land Trusts

Vashon-Maury Island Land Trust. 206.463.2644

Cascade Land Conservancy. 206.292.5907
http://www.cascadeland.org/index.htm

Trust for Public Lands. 206.587.2447
http://www.tpl.org

King County Programs

Office of Open Space. 206.296.780

Public Benefit Rating System. 206. 205.5170
http://dnr.metrokc.gov/wlr/LANDS/incentiv.htm

Vashon-Maury Island Steward. 206.296.8362
http://dnr.metrokc.gov/wlr/BASINS/Bsprgm.htm

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Produced in partnership by the King County Department of Natural Resources and Parks, Puget Sound Water Quality Action Team, King Conservation District, and the Green/Duwamish and Central Puget Sound Watershed Forum.

Alternate formats of this booklet will be provided
to people with disabilities upon request.
TTY Access: 1.800.833.6388
Voice: 206.296.8361

King County
Department of
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Puget Sound
Water Quality
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Office of the Governor

King Conservation District

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Want to know more? Get involved?

❑ Please call me about preserving or restoring my shoreline.

❑ Please call me about alternatives to bulkheads.

Please send me more information about:

❑ Marine and shoreline ecosystems

❑ Watersheds, streams, and wetland ecosystems

❑ Home and gardening tips for a healthier Puget Sound

❑ Native plants

❑ Volunteer opportunities to preserve and restore ecosystems

❑ Funding sources for community stewardship projects

Name _____

Address _____

City _____ State _____ Zip _____

Phone ( ) _____ Email _____

Got 3 minutes? Your feedback is valuable!

How did you get this book? _____

Did you learn anything new from this book? What? _____

What did you find most useful? _____

What other information would you like to see in the book? _____

Do you plan to use any of the suggestions in the book? Which ones? _____

Additional comments? _____

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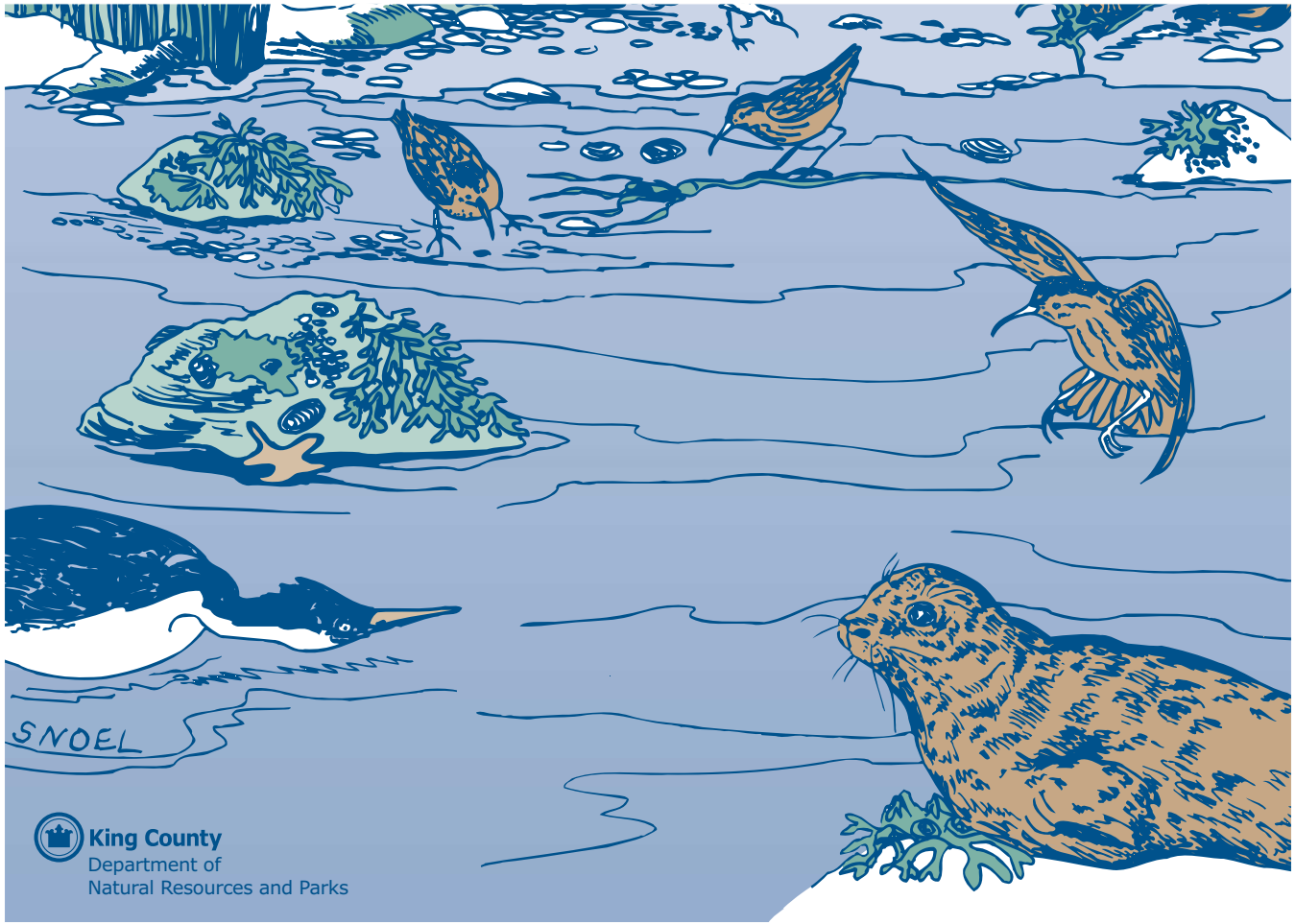
SEATTLE, WA 98104-9856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